

FIG. 1

TEMPERATURE OF HEATING UNIT \ COMPONENT	N <sub>2</sub> O	N <sub>2</sub>	O <sub>2</sub>	NO	NO <sub>2</sub>
1 0 0 0 °C	1	4 7	1 9	0. 3	3. 0
9 0 0 °C	8	4 0	1 7	0. 2	2. 0
7 5 0 °C	5 4	2 8	1 3	0. 0 5	0. 5

(%)

FIG. 2

	FILM THICKNESS	Peak N VOLUME
EMBODIMENT	2. 0 0 nm	2. 2 4 a t o m i c %
COMPARATIVE EXAMPLE 1	3. 3 6 nm	2. 3 3 a t o m i c %
COMPARATIVE EXAMPLE 2	2. 0 0 nm	0. 8 7 a t o m i c %

FIG. 3

	T 1	T 2	T 3	T 4
EMBODIMENT	7 9 8. 6	8 0 0. 2	8 0 0. 1	8 0 2. 6
COMPARATIVE EXAMPLE 3	7 9 8. 4	8 0 0. 1	7 9 9. 9	8 0 1. 8

(°C)

FIG. 4

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PROCESSING CONDITION	TEMPERATURE OF REACTION TUBE	7 5 0 °C	8 0 0 °C	8 5 0 °C
HEATING UNIT 900 °C	THICKNESS INCREMENT	0. 2 9	0. 5 0	0. 9 0
REACTION TIME 15 MIN	PEAK N VOLUME	0. 5 5	1. 0 5	1. 5 3
HEATING UNIT 1000 °C	THICKNESS INCREMENT	0. 2 8	0. 4 7	0. 8 8
REACTION TIME 15 MIN	PEAK N VOLUME	1. 1 3	1. 2 4	1. 6 6
HEATING UNIT 1000 °C	THICKNESS INCREMENT	0. 3 6	0. 7 5	1. 0 9
REACTION TIME 30 MIN	PEAK N VOLUME	0. 7 8	1. 7 2	1. 8 3
HEATING UNIT NOT HEATED	THICKNESS INCREMENT	0. 3 0	0. 5 4	1. 0 1
REACTION TIME 15 MIN	PEAK N VOLUME	0. 2 1	0. 3 6	0. 5 2

( THICKNESS INCREMENT : nm, PEAK N VOLUME : atomic % )

F I G. 5

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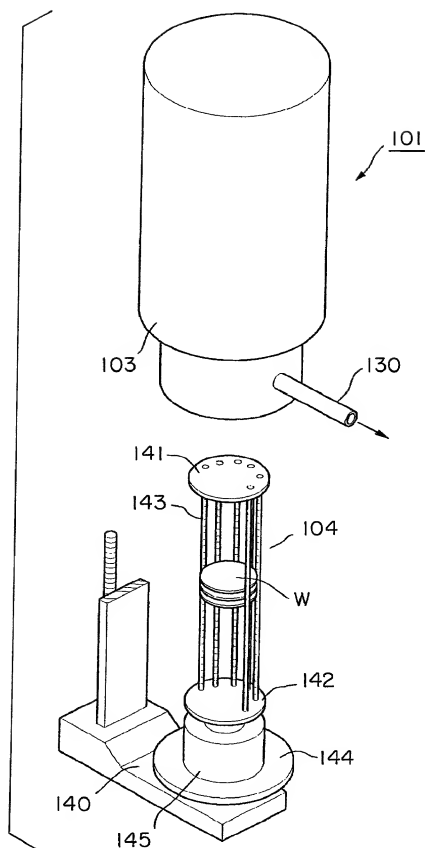


FIG. 7

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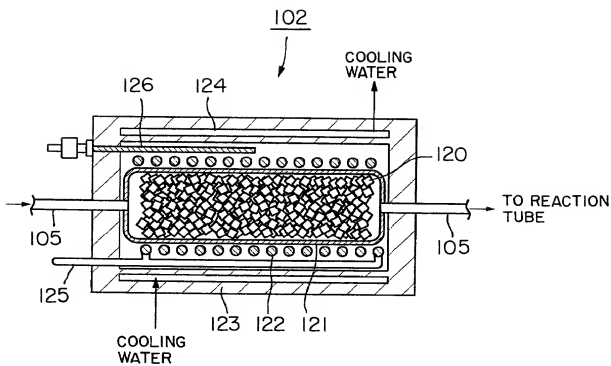


FIG. 8

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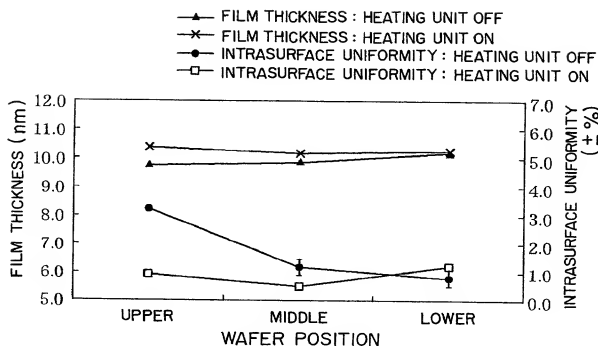


FIG. 9

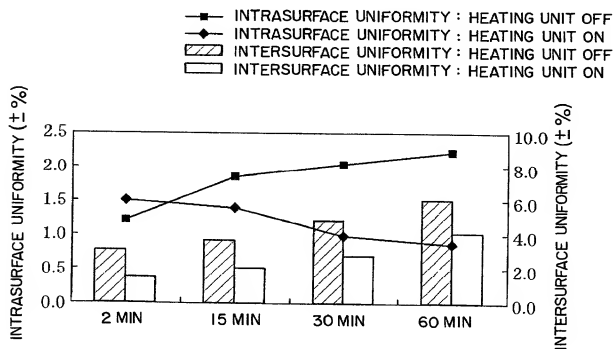


FIG. 10

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Test No.	HEATING UNIT	ANALYSIS STARTING TIME (min)	H <sub>2</sub> DENSITY (ppm)
①	ON	30	<5
②		50	<5
③	OFF	30	23
④		50	78
⑤		70	24

FIG. 11

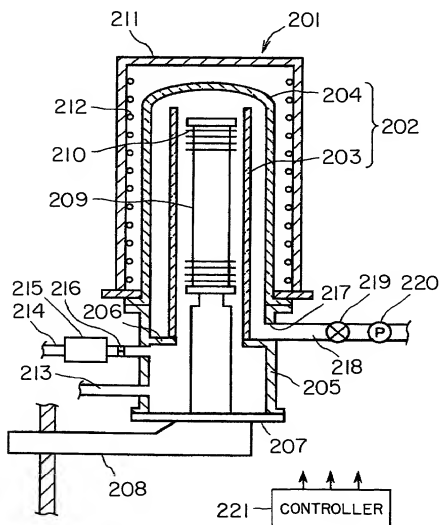


FIG. 12



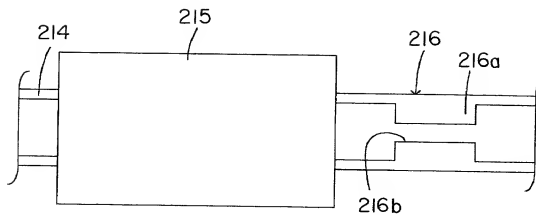
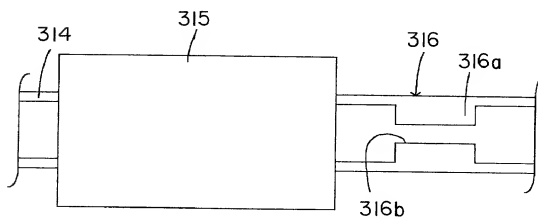
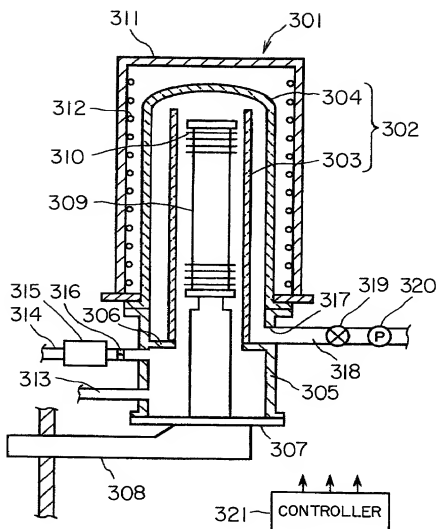


FIG. 13

	TEMPERATURE OF REACTION TUBE	D/R	R I
EMBODIMENT	5 5 0 °C	0. 7 0 nm/min	2. 0
COMPARATIVE EXAMPLE	5 5 0 °C	0. 2 7 nm/min	2. 9

FIG. 14

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TEMPERATURE OF HEATING UNIT	OXYGEN CONCENTRATION
6 0 0 °C	5 %
7 0 0 °C	1 1 %
7 5 0 °C	1 3 %
8 0 0 °C	1 4 %
9 0 0 °C	1 7 %
9 5 0 °C	1 9 %
1 0 0 0 °C	1 9 %

FIG. 17

TEMPERATURE OF HEATING UNIT	FILM FORMING RATE
NOT HEATED	0 . 0 7 nm / m i n
5 0 0 °C	0 . 0 7 nm / m i n
6 0 0 °C	0 . 0 8 nm / m i n
7 0 0 °C	0 . 1 4 nm / m i n
7 5 0 °C	0 . 2 7 nm / m i n
8 0 0 °C	0 . 4 8 nm / m i n
9 0 0 °C	0 . 7 2 nm / m i n
9 5 0 °C	0 . 7 8 nm / m i n
1 0 0 0 °C	0 . 7 8 nm / m i n

FIG. 18

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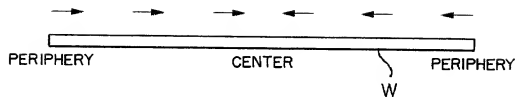


FIG. 19A

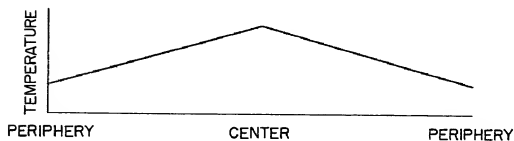


FIG. 19B

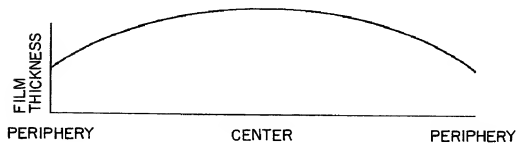


FIG. 19C

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